Shigellosis

(Bacterial Dysentery)

Section 1:

ABOUT THE DISEASE

A. Etiologic Agent

Shigellosis refers to disease caused by any bacteria in the genus *Shigella*. There are four *Shigella* species: *S. dysenteriae, S. flexneri, S. boydii,* and *S. sonnei*.

B. Clinical Description

The most common symptoms of shigellosis are diarrhea (sometimes with blood and mucus due to inflammation of the bowel [dysentery]), fever, nausea, vomiting, and stomach cramps. Dehydration may be severe, especially among infants and the elderly. Asymptomatic infections also occur. The disease is usually self-limiting, lasting 4–7 days. The severity of the illness and the case-fatality rate are usually a function of the host and the species, with the very young and the elderly experiencing the most severe illness. *S. dysenteriae* is usually associated with more severe disease and complications.

C. Vectors and Reservoirs

Humans are the only significant reservoir for *Shigella* sp.

D. Modes of Transmission

Shigella are transmitted via the fecal-oral route. The most common mode of transmission is person-to-person spread of the bacteria from a case or carrier. A very small dose (probably 10–100 organisms) of *Shigella* is sufficient to cause illness in many cases. Individuals shedding the bacteria may also contaminate food by failing to wash their hands before food handling activities, potentially causing large numbers of people to become ill. Person-to-person spread typically occurs among household contacts, preschool children in daycare, and the elderly and developmentally disabled living in residential facilities. Transmission can also occur from person to person through certain types of sexual contact (e.g., oral-anal contact). Flies can potentially spread the bacteria by landing on contaminated feces and then on food.

E. Incubation Period

The incubation period can vary from 12–96 hours, but is usually about 1–3 days. It can be up to one week for *S. dysenteriae.*

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes *Shigella* in his/her stool. This usually lasts for about four weeks from onset of illness. Effective antibiotic treatment has been shown to decrease the shedding period to a few days.

G. Epidemiology

Shigellosis has a worldwide distribution, with approximately 600,000 deaths reported annually throughout the world. Most of these deaths occur in children. Secondary attack rates can be as high as 40% in households. Approximately 300 cases are reported in Massachusetts annually. Outbreaks occur in childcare settings, among men who have sex with men, and in jails. In the summer of 1991 and in 1999, over 1000 cases of shigellosis occurred in western Massachusetts, mostly through person-to-person spread among young children. Outbreaks have also been caused by contaminated imported food. *S. sonnei* is the most common *Shigella* species reported in Massachusetts.

H. Bioterrorist Potential

Shigella is listed by the CDC as a Category B bioterrorist agent. If acquired and properly disseminated, *Shigella* could cause a serious public health challenge.

Section 2:
REPORTING CRITERIA AND LABORATORY TESTING

A. What to Report to the Massachusetts Department of Public Health (MDPH)

Report isolation of *Shigella* species from any clinical specimen.

Note: See Section 3C for information on how to report a case.

B. Laboratory Testing Services Available

The MDPH State Laboratory Institute (SLI), Enteric Laboratory will test stool specimens for the presence of *Shigella* and will perform confirmatory testing and speciation on isolates from clinical specimens. In addition, the SLI Enteric Laboratory requests submission of all *Shigella* isolates for further testing for disease surveillance purposes.

The SLI Food Microbiology Laboratory, at (617) 983-6610, will test implicated food items from case clusters or outbreaks. See Section 4D for more information.

For more information about testing and specimen submission, contact the SLI Enteric Laboratory at (617) 983-6609.

Section 3:
REPORTING RESPONSIBILITIES AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (e.g., a diapered child, daycare attendee, or food handler), and if so, to prevent further transmission.

- To identify transmission sources of public health concern (e.g., a restaurant or a commercially distributed food product), and to stop transmission from such sources.

B. Laboratory and Health Care Provider Reporting Requirements

Shigellosis is reportable to the local board of health (LBOH). The MDPH requests that health care providers immediately report to the LBOH in the community where the case is diagnosed, all confirmed or suspect cases of shigellosis, as defined by the reporting criteria in Section 2A.

Laboratories performing examinations on any specimens derived from Massachusetts residents that yield evidence of *Shigella* shall report such evidence of infection directly to the MDPH within 24 hours.

C. Local Board of Health (LBOH) Reporting and Follow-Up Responsibilities

Reporting Requirements

MDPH regulations *(105 CMR 300.000)* stipulate that shigellosis is reportable to the LBOH and that each LBOH must report any confirmed or suspect case, as defined by the reporting criteria in Section 2A. Cases should be reported to the MDPH Bureau of Communicable Disease Control, Office of Integrated Surveillance and Informatics Services (ISIS) using a MDPH *Enteric Disease Case Report Form* (found at the end of this chapter). Refer to the *Local Board of Health Timeline* at the end of this manual's *Introduction* section for information on prioritization and timeliness requirements of reporting and case investigation.

Case Investigation

1. It is the responsibility of the LBOH to complete a MDPH *Enteric Disease Case Report Form* (found at the end of this chapter) by interviewing the case and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the health care provider or from the medical record.
2. Use the following guidelines to assist in completing the form:
   a. Accurately record the demographic information.
   b. Accurately record all available clinical information, including onset date, symptoms, information regarding hospitalization, and clinician contact information.
   c. Indicate *Shigella* as the etiologic agent.
   d. When asking about exposure history (e.g., food, travel, activities), if possible, use the entire incubation period range for shigellosis (12–96 hours). Specifically focus, however, on the 1–3 days prior to the case's onset, which is the usual range.
   e. Record information pertaining to the case's possible exposures, including any restaurants at which the case ate as well as food item(s) consumed and date(s) of consumption. If you suspect that the case became infected through food, use the MDPH *Foodborne Illness Complaint Worksheet* (found at the end of this chapter) to facilitate recording additional information. It is requested that the LBOH fax or mail this worksheet to the MDPH Center for Environmental Health, Food Protection Program (FPP); see top of worksheet for fax number and address. This information is entered into a database to help link other complaints from neighboring towns, thus helping to identify foodborne illness outbreaks. *Note: This worksheet does not replace the MDPH Enteric Disease Case Report Form.*
   f. Ask questions about travel history and outdoor activities to help identify where the case became infected.

g. Ask questions about water supply as shigellosis may be acquired through water consumption. Record this information in the "Comments" section.

h. Household/close contact, pet or other animal contact, daycare, and food handler questions are designed to examine the case's risk of having acquired the illness from or the case's potential for transmitting it to these contacts. Determine whether the case attends or works at a daycare facility and/or is a food handler.

i. If you have made several attempts to obtain case information but have been unsuccessful (e.g., the case or health care provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as you have gathered. Please note on the form the reason(s) why it could not be filled out completely.

3. After completing the form, attach laboratory report(s) and fax or mail (in an envelope marked "Confidential") to ISIS. The confidential fax number is (617) 983-6813. Call ISIS at (617) 983-6801 to confirm receipt of your fax. The mailing address is:

MDPH, Office of Integrated Surveillance and Informatics Services (ISIS)
305 South Street, 5th Floor
Jamaica Plain, MA 02130
Fax: (617) 983-6813

4. Institution of disease control measures is an integral part of case investigation. It is the responsibility of the LBOH to understand, and if necessary, institute the control guidelines listed in Section 4.

Section 4:
CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements *(105 CMR 300.200)*

Food handlers with shigellosis must be excluded from work.

Note: A case of shigellosis is defined by the reporting criteria in Section 2A.

Minimum Period of Isolation of Patient

After diarrhea has resolved, food handlers may return to food handling duties only after producing 2 negative stool specimens, taken at least 48 hours apart. If a case was treated with an antimicrobial, the stool specimen shall not be collected until at least 48 hours after cessation of therapy.

Minimum Period of Quarantine of Contacts

Contacts who are food handlers and have diarrhea shall be considered the same as a case and shall be handled in the same fashion. In outbreak circumstances, asymptomatic contacts who are food handlers shall be required to produce 2 negative stool specimens, taken 24 hours apart. No restrictions otherwise.

Note: A food handler is any person directly preparing or handling food. This can include a patient care or childcare provider. See Glossary (at the end of this manual) for a more complete definition.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Daycare

Since shigellosis may be transmitted from person to person through fecal-oral transmission, it is important to follow up carefully on cases of shigellosis in a daycare setting. General recommendations include:

- Children with *Shigella* infection who have diarrhea should be excluded until their diarrhea is resolved.
- Children with *Shigella* infection who have no diarrhea and are not otherwise ill may be excluded or may remain in the program if special precautions are taken.
- Since most staff in childcare programs are considered food handlers, those with *Shigella* in their stool (symptomatic or not) can remain on site, but must not prepare food or feed children until diarrhea is resolved and they have 2 negative stool specimens, taken at least 48 hours apart and collected at least 48 hours after completion of antibiotic therapy, if antibiotics are given (per *105 CMR 300.200*).

School

Since shigellosis may be transmitted from person to person through fecal-oral transmission, it is important to follow up carefully on cases of shigellosis in a school setting. The MDPH *Comprehensive School Health Manual* provides detailed information on case follow-up and control in a school setting. General recommendations include:

- Students or staff with *Shigella* infection who have diarrhea should be excluded until their diarrhea is resolved.
- Students or staff with *Shigella* who do not handle food, have no diarrhea or mild diarrhea, and are not otherwise sick may remain in school if special precautions are taken.
- Students or staff who handle food and have *Shigella* infection (symptomatic or not) must not prepare food until their diarrhea is resolved and they have 2 negative stool specimens, taken at least 48 hours apart and collected at least 48 hours after completion of antibiotic therapy, if antibiotics are given (per *105 CMR 300.200*).

Refer to Chapter 8 of the MDPH *Comprehensive School Health Manual* for complete guidelines on handling diseases spread through the intestinal tract.

Community Residential Programs

Actions taken in response to a case of shigellosis in a community residential program will depend on the type of program and the level of functioning of the residents.

In long-term care facilities, residents with shigellosis should be placed on standard (including enteric) precautions until their symptoms subside and they test negative for *Shigella*. Refer to the MDPH Division of Epidemiology and Immunization's *Control Guidelines for Long-Term Care Facilities* document for further actions. A copy can be obtained by calling the MDPH Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850 or on the MDPH website at www.mass.gov/dph.

Staff members who give direct patient care (e.g., feed patients, give mouth or denture care, or give medications) are considered food handlers and are subject to food handler restrictions under *105 CMR 300.200*. (See Section 4A for more information.) In addition, staff members with *Shigella* infection who are not food handlers should not work until their diarrhea is resolved.

In residential facilities for the developmentally disabled, staff and clients with shigellosis must refrain from handling or preparing food for residents until their symptoms have subsided and they have 2 negative stool specimens, taken at least 48 hours apart and collected at least 48 hours after completion of antibiotic therapy, if antibiotics are given. In addition, staff members with *Shigella* infection who are not food handlers should not work until their diarrhea is resolved.

Reported Incidence Is Higher Than Usual/Outbreak Suspected

If the number of reported cases of shigellosis in your city/town is higher than usual or if you suspect an outbreak, investigate to determine the source of infection and the mode of transmission. A common vehicle (e.g., water, food, or association with a daycare center) should be sought, and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the epidemiologist on-call at the MDPH Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850. The Division can help determine a course of action to prevent further cases and can perform surveillance for cases across town lines, which would otherwise be difficult to identify at the local level.

D. Preventive Measures

Environmental Measures

Implicated food items must be removed from consumption. A decision about testing implicated food items can be made in consultation with the FPP or the MDPH Division of Epidemiology and Immunization. The FPP can help coordinate pickup and testing of food samples. If a commercial product is suspected, the FPP will coordinate follow-up with relevant outside agencies.

Note: The role of the FPP is to establish policy and to provide technical assistance with the environmental investigation, such as interpreting the Massachusetts Food Code, conducting a Hazard Analysis and Critical Control Point (HACCP) risk assessment, initiating enforcement actions, and collecting food samples.

The general policy of the SLI is to test only food samples implicated in suspected outbreaks, not in single cases (except when botulism is suspected). The LBOH may suggest that the holders of food implicated in single case incidents locate a private laboratory that will test food or store the food in their freezer for a period of time, in case additional reports are received. However, a single, confirmed case with leftover food consumed within the incubation period may be considered for testing under certain circumstances.

Note: Refer to the MDPH Foodborne Illness Investigation and Control Reference Manual for comprehensive information on investigating foodborne illness complaints and outbreaks. Copies of this manual have been made available to LBOH. It can also be located on the MDPH website in PDF format at www.mass.gov/dph/fpp/refman.htm. For the most recent changes to the Massachusetts Food Code, contact the FPP at (617) 983-6712 or through the MDPH website at www.mass.gov/dph/fpp.

Personal Preventive Measures/Education

To avoid future exposures, recommend that individuals:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, after changing diapers, and after contact with animals, especially cattle.
- Wash the child's hands as well as their own hands after changing a child's diapers, and dispose of feces in a sanitary manner.
- Wash their hands thoroughly and frequently when ill with diarrhea or when caring for someone with diarrhea. Hands should be scrubbed for at least 15–20 seconds after cleaning the bathroom; after using the toilet or helping someone use the toilet; after changing diapers; before handling food; and before eating.
- Keep flies from contaminating food.

Discuss transmission risks that may result from oral-anal sexual contact. Latex barrier protection (e.g., dental dam) may prevent the spread of *Shigella* to a case's sexual partners and may prevent exposure to and transmission of other fecal-oral pathogens.

A *Shigella* Public Health Fact Sheet is available from the MDPH Division of Epidemiology and Immunization or on the MDPH website at www.mass.gov/dph. Click on the "Publications and Statistics" link, and select the "Public Health Fact Sheets" section under "Communicable Disease Control." The fact sheet is also available in Spanish.

International Travel

The following recommendations can be helpful to travelers to developing countries:

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than non-carbonated bottled water.
- Ask for drinks without ice, unless the ice is made from bottled or boiled water. Avoid popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables such as lettuce are easily contaminated and are very hard to wash well.
- Peel your own raw fruits or vegetables, and do not eat the peelings.
- Avoid foods and beverages from street vendors.

Note: For more information regarding international travel, contact the Center for Disease Control and Prevention (CDC) Traveler's Health Office at (877) 394-8747 or through the CDC website at www.cdc.gov/travel.

ADDITIONAL INFORMATION

The formal CDC surveillance case definition for shigellosis is the same as the criteria outlined in Section 2A of this chapter. It is provided for your information only and should not affect the investigation and reporting of a case that fulfills the criteria in Section 2A of this chapter. For reporting to the MDPH, always use the criteria outlined in Section 2A.

Note: The most up-to-date CDC case definitions are available on the CDC website at www.cdc.gov/epo/dphsi/casedef/case_definitions.htm.

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FORMS & WORKSHEETS

Shigellosis
(Bacterial Dysentery)

Shigellosis

(Bacterial Dysentery)

LBOH Action Steps

This form does not need to be submitted to the MDPH with the case report form. It is for LBOH use and is meant as a quick-reference guide to shigellosis case investigation activities.

LBOH staff should follow these steps when shigellosis is suspected or confirmed in the community. For more detailed information, including disease epidemiology, reporting, case investigation, and follow-up, refer to the preceding chapter.

- ❑ Notify the MDPH Division of Epidemiology and Immunization, at (617) 983-6800 or (888) 658-2850, to report any suspect or confirmed case(s) of shigellosis.
- ❑ Obtain laboratory confirmation.
- ❑ For shigellosis suspected to be the result of food consumption, complete a MDPH *Foodborne Illness Complaint Worksheet* and forward to the MDPH Center for Environmental Health, Food Protection Program (FPP).
- ❑ Contact the MDPH Division of Epidemiology and Immunization or the FPP to discuss whether or not to submit suspect foods for testing.
- ❑ Identify other potential exposure sources.
- ❑ Determine whether the case attends or works at a daycare facility and/or is a food handler.
- ❑ Identify other potentially exposed persons.
- ❑ Institute isolation and quarantine requirements *(105 CMR 300.200)*, as they apply to a particular case.
- ❑ Fill out the case report form (attach laboratory results).
- ❑ Send the completed case report form (with laboratory results) to the MDPH Bureau of Communicable Disease Control, Office of Integrated Surveillance and Informatics Services (ISIS).